

Trientine (triethylenetetramine) formulations available in the UK

(November 2020)

BASL Wilson's Disease Special Interest Group *Zoom* Meeting

Friday, 20th November 2020

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Trientine formulations available in the UK

(as of November 2020)

- **Cufence™ — Trientine dihydrochloride**

Univar Solutions B.V. (Rotterdam, The Netherlands)



- **Cuprior™ — Trientine tetrahydrochloride**

Orphalan UK (formerly GMP Orphan) (St Albans, UK and Paris, France)



- **Trientine dihydrochloride Tillomed**

Tillomed Laboratories Ltd (Luton, UK) owned by Emcure (India)

[Data from electronic medicines compendium (emc) <https://www.medicines.org.uk/emc/about-the-emc> Other suppliers in USA (<https://www.drugs.com/availability/generic-syprine.html>) and in Europe (<https://ideogen.ch/morbus-wilson-1>)]

UK trientine formulations – SmPC information

- ❑ Cufence 200 mg hard capsules trientine *[as identified in patient leaflet]*

Each size 0 hard capsule contains 300 mg trientine dihydrochloride

— equivalent to 200 mg trientine (free base)

- ❑ Cuprior 150 mg film-coated tablets trientine *[as identified in patient leaflet]*

Each film-coated tablet contains 300 mg trientine tetrahydrochloride

— equivalent to 150 mg trientine (free base)

- ❑ Trientine dihydrochloride Tillomed 250 mg hard capsules trientine dihydrochloride *[as identified in patient leaflet]*

Each hard capsule contains 250 mg trientine dihydrochloride

— equivalent to 167 mg trientine (free base)

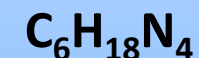
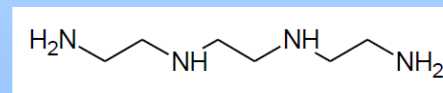
Comparison of UK trientine formulations^a

- ☐ Size and description of formulation^a
- ☐ Dosage form and packaging^a
- ☐ Storage conditions^a
- ☐ Bioequivalence and dose equivalence data for Cufence^a and Cuprior^{a,b}
- ☐ Licensed dose^a

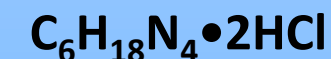
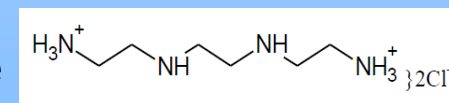
- See notes circulated for this meeting for more details of UK trientine formulations:
[Trientine Formulations in the UK \(2020\).pdf \(basl.org.uk\)](#).
- Peer-reviewed bioequivalence data for Cuprior *cf.* Cufence are not yet available (November 2020).

Trientine dose equivalents — calculations

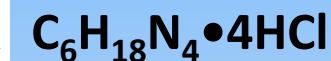
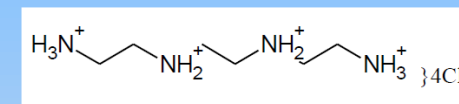
Trientine (free base) — molar mass: **146.2** grams/mole



Trientine dihydrochloride — molar mass: **219.2** grams/mole



Trientine tetrahydrochloride — molar mass: **292.1** grams/mole



i.e. **219.2** g trientine•2HCl \equiv **146.2** g trientine free base \equiv **292.1** g trientine•4HCl

\therefore **ONE** 300 mg trientine•2HCl capsule \equiv 200 mg trientine free base

\therefore **ONE** 300 mg trientine•4HCl tablet \equiv 150 mg trientine free base

Cost of Cuprior in the UK^a

- ❑ Reported cost for a one year supply of Cuprior per patient = £40,000 (November 2020)
- ❑ For a patient on 4 x 150 mg Cuprior tablets daily, one year's supply = **219 g** trientine base
- ❑ Technical grade (70%) trientine base = £4.2/1000 g^b, i.e. **219 g** = £0.92
- ❑ Percentage markup = [(sales price – unit cost) / unit cost] x 100%
- ❑ i.e. [(£40,000 – £0.92) / £0.92] x 100 = 4.4 x 10⁶ per cent; **4.4 million per cent markup**
 - ^a Similar arithmetic would apply to the cost of Cufence in the UK.
 - ^b Data from Alibaba website (price and currency rate quoted in November 2020):

[Hot Sale Industry Grade Triethylenetetramine With Good Price - Buy Triethylenetetramine,Triethylenetetramine Price,Industry Grade Triethylenetetramine Product on Alibaba.com](#)

Comments on Tillomed's trientine dihydrochloride

- ❑ API is manufactured by Emcure, Pune, India.
- ❑ Probably a different manufacturing route than that used for Cufence and Cuprior (patent data).
- ❑ Questionable claim for stability in Tillomed's Summary of Product Characteristics:
“This medicinal product does not require any special temperature storage conditions.”
- ❑ FDA has issued a number of Warning Letters after inspections of Emcure's Pune manufacturing facilities.